REMARKS

The Office Action mailed January 16, 2008, and made final, has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 1-19 are now pending in this application. Claims 1-7 stand rejected. Claims 8-19 have been withdrawn from consideration.

The rejection of Claims 1-7 under 35 U.S.C. § 103(a) as being unpatentable over Randolph, Jr. et al. (U.S. Pat. No. 6,453,211) ("Randolph") in view of Applicants' Admitted Prior Art ("AAPA") and further in view of Burke et al. (U.S. Pat. No. 6,508,000) ("Burke") is respectfully traversed.

Initially, Applicants respectfully submit that the Section 103 rejection of Claims 1-7 is not a proper rejection. Applicants respectfully disagree with the assertion in the Office Action on page 3 that Randolph "teaches the steps of determining a reparability limit, removing titanium material from the damaged area of the leading edge (42) of each blade (12b) based on the determined limit, step of depositing titanium weld material onto the leading edge (42) of each blade (12b), and step of removing at least some of the titanium weld material to obtain a desired finish." Specifically, Applicants respectfully traverse the assertion that Randolph teaches a step of using *titanium* as a weld material and submit that in contrast to such assertion Randolph is silent with regard to weld materials used.

Randolph describes a method of repairing blades (12b) of a blisk (12). The method includes cutting away bend damage (32) of the blade (12b) to form a cutout (46) at a leading edge (42) of blade (12b). Cutout (46) is then filled with weld material or an insert welded metallic spade to form a weld repair (48) that is larger than a nominal configuration of the blade (12b). Randolph also describes that "[i]n a recent development program, the weld repair of titanium blisk for a gas turbine compressor application is being explored. Damage to the relatively thin leading or trailing edges of an individual blade may be repaired by removing the damaged portion and weld repairing the remaining cutout." (col. 2, lines 14-19). Notably, Randolph does not describe nor suggest a repair method that includes determining an airfoil reparability limit, wherein the limit defines a maximum chord reduction and a minimum blade thickness, determining a portion of titanium alloy material to be removed based on the determined airfoil reparability limit, removing the determined

portion of titanium alloy material from along leading and trailing edges of the airfoil, and along an entire edge area of a radially outer tip of the airfoil to form respective leading edge, trailing edge, and tip cut-backs. Further, Randolph does not describe nor suggest a method that includes depositing *titanium weld material onto the leading edge, trailing edge, and tip cut-backs*.

AAPA describes an exemplary method of repairing a turbine compressor blade by mechanically removing a worn and/or damaged tip area and adding a material deposit to the tip area to reform the area to the desired dimension. Notably, AAPA does not describe nor suggest a repair method that includes determining an airfoil reparability limit, wherein the limit defines a maximum chord reduction and a minimum blade thickness, determining a portion of titanium alloy material to be removed based on the determined airfoil reparability limit, removing the determined portion of titanium alloy material from along leading and trailing edges of the airfoil, and along an entire edge area of a radially outer tip of the airfoil to form respective leading edge, trailing edge, and tip cut-backs. Further, AAPA does not describe nor suggest a method that includes depositing *titanium weld material onto the leading edge, trailing edge, and tip cut-backs*.

Burke describes a method for repairing airfoil blades (3, 18, and/or 42) along a leading, a trailing edge, or a tip. The method includes removing a portion of the airfoil (3, 18, and/or 42) and replacing the portion with an insert (1). More specifically, the insert (1) is shaped as an arc segment and is transient liquid phase bonded to the original airfoil (3, 18, and/or 42). To perform the transient liquid phase bonding, the insert (1) must be crystallographically and structurally aligned with the original airfoil (3, 18, and/or 42) to avoid forming discontinuities across a bond line. More specifically, the insert (1) must have the same grain/crystal size, alignment, and/or orientation as the original airfoil (3, 18, and/or 42). Mismatches in grain/crystal size, alignment, and/or orientation produce deleterious grain boundaries within the bond. A bond medium or bond foil, for the transient liquid phase bonding must match the chemistry of the insert (1) and the airfoil (3, 18, and/or 42) material to form a uniform microstructure and chemical composition along the bond line. Titanium is then removed from the bond foil to avoid deleterious gamma prime eutectics at a bond center line. Notably, Burke does not describe nor suggest a repair method that includes determining an airfoil reparability limit, wherein the limit defines a maximum chord reduction and a minimum blade thickness, determining a portion of titanium alloy material to be removed

based on the determined airfoil reparability limit, removing the determined portion of titanium alloy material from along leading and trailing edges of the airfoil, and along an entire edge area of a radially outer tip of the airfoil to form respective leading edge, trailing edge. Further, Burke does not describe nor suggest a method that includes depositing *titanium weld material onto the leading edge, trailing edge, and tip cut-backs.*

Claim 1 recites a method of repairing a gas turbine engine compressor blade airfoil that includes "determining an airfoil reparability limit, the limit defining a maximum chord reduction and a minimum blade thickness . . . determining a portion of titanium alloy material to be removed based on the determined airfoil reparability limit . . . removing the determined portion of titanium alloy material from along leading and trailing edges of the airfoil, and along an entire edge area of a radially outer tip of the airfoil to form respective leading edge, trailing edge, and tip cut-backs which each define cut-back depths, wherein the edge area extends from the leading edge to the trailing edge . . . depositing titanium weld material onto the leading edge, trailing edge, and tip cut-backs . . . and removing at least some of the titanium weld material to obtain pre-desired finished dimensions for the leading and trailing edges, and radially outer tip."

No combination of Randolph, AAPA, and Burke describes nor suggests a method of repairing a gas turbine engine compressor blade airfoil as is recited in Claim 1. More specifically, no combination of Randolph, AAPA, and Burke describes nor suggests a repair method that includes determining an airfoil reparability limit, wherein the limit defines a maximum chord reduction and a minimum blade thickness, determining a portion of titanium alloy material to be removed based on the determined airfoil reparability limit, removing the determined portion of titanium alloy material from along leading and trailing edges of the airfoil, and along an entire edge area of a radially outer tip of the airfoil to form respective leading edge, trailing edge, and tip cut-backs which each define cut-back depths. Moreover, no combination of Randolph, AAPA, and Burke describes nor suggests a method that includes depositing titanium weld material onto the leading edge, trailing edge, and tip cut-backs. Rather, in contrast to the present invention, Randolph describes removing damaged leading and trailing edge portions of a titanium blisk and weld repairing the blisk, AAPA only describes removing a damaged tip area and adding a material deposit to only that portion of the tip area, and Burke describes an insert transient liquid phase bonded to an airfoil to create a bond with a uniform microstructure and chemical composition. Accordingly, for at

least the reasons set forth above, Claim 1 is submitted to be patentable over Randolph in view of AAPA, and further in view of Burke.

Claims 2-7 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 2-7 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2-7 likewise are patentable over Randolph in view of AAPA, and further in view of Burke.

Furthermore, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. It appears that the present rejection reflects an impermissible attempt to use the instant claims as a guide or roadmap in formulating the rejection using impermissible hindsight reconstruction of the invention. The United States Supreme Court has recently expressed concern regarding distortion caused by hindsight bias in an obviousness analysis, and notes that factfinders should be cautious of arguments reliant upon ex post reasoning. See KSR International Co. v. Teleflex, Inc., slip Opinion at page 17. The Supreme Court also explained that, following "common sense," "familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle." Id. at page 16. Applicants respectfully submit that the teachings of Randolph, AAPA, and Burke do not fit together like pieces of a puzzle, but rather are three isolated disclosures, which have been chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection be withdrawn.

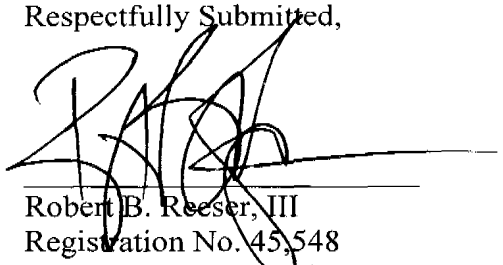
Moreover, Burke requires the removal of titanium from a bonding foil to avoid formation of deleterious gamma prime eutectics at a bond line. As such, Applicants respectfully submit that it would not have been obvious to one skilled in the art to combine the titanium blisks of Randoph with non-titanium bonding foil of Burke. As such, the combination of Randolph and AAPA with Burke would not result in a method that includes depositing titanium weld material onto the leading edge, trailing edge, and tip cut-backs, as is required by Applicants' claimed invention. Accordingly, for this reason alone, Applicants respectfully request that the Section 103 rejection of Claims 1-7 be withdrawn.

For at least the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 1-7 be withdrawn.

In view of the foregoing amendment and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Applicants do not believe any fees are due in connection with this amendment; however, the Commissioner is hereby authorized to charge any fees which may be required to Deposit Account No. 012384 in the name of ARMSTRONG TEASDALE LLP.

Respectfully Submitted,



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